Remarks

The Office Action mailed August 10, 2006 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-27 are now pending in this application. Claims 1-20 stand rejected. Claims 21-27 have been withdrawn.

The rejection of Claims 1-20 under 35 U.S.C. § 103(a) as being unpatentable over Zaugg (U.S. Patent 4,522,024) in view of Payling et al. (U.S. Patent 6,467,252) (hereinafter referred to as "Payling") and optionally in view of Tsukamoto et al. (U.S. Patent 6,397,578) (hereinafter referred to as "Tsukamoto") is respectfully traversed.

Further, the rejection of Claims 1-20 under 35 U.S.C. § 103(a) as being unpatentable over Payling in view of Zaugg and optionally in view of Tsukamoto is respectfully traversed.

Zaugg describes a power station that includes a gas turbine (1) that is used to drive both a generator (2) and an air compressor (3). The power station also includes an intercooler (5) that is installed between a low-pressure stage and medium-pressure stage, and between the medium-pressure stage and a high-pressure stage of the compressor group. Condensate is channeled from intercooler (5) into an intermediate condensate vessel (11), and then is channeled into a main condensate vessel (13). The condensate from vessel (13) is then channeled to a pair of combustion chambers (8 and 9) to reduce emissions in the engine. Specifically, "[w]hile the turbine is operating, the condensate is conveyed...into injection devices 16 of a low-pressure combustion chamber 8 [and] a high-pressure combustion chamber 9 of the gas turbine" (Column 2, lines 45-51). Zaugg further describes, as shown in Figure 1, that the cooled air from intercooler (5) is returned to compressor (3). As such, the cooled air and the condensate from intercooler (5) are channeled to separate components within the power station. Specifically, the condensate is channeled to combustors (8 and 9) to reduce emissions, and the cooled air is channeled to compressor (3) to reduce compressor drive power. In contrast, the present invention describes channeling both the cooled air and

the condensate from an intercooler into a compressor to facilitate reducing a temperature of the engine.

Further, in contrast to the assertion on pages 3 and 4 of the Office Action that "[i]t would have been obvious to one of ordinary skill in the art to inject the water between the compressor stages, as taught by Payling", Zaugg specifically teaches against injecting water into the compressor stages. Specifically, Zaugg recites that "[i]n order to avoid disturbances in the machines and apparatuses, [the] **condensate must be removed from the compressor-circuit by water separators**." (Column 1, lines 37-39) Zaugg further recites that "[t]he present invention is to use this condensate in an advantageous manner...for injection into the combustion chamber of the turbine." (Column 1, lines 48-51) As such, the purpose of Zaugg is to **remove water from the compressor stages and to utilize the water within the combustor stages**. Therefore, in contrast to the assertion in the Office Action, it would not have been obvious to combine Zaugg and Payling, which describes injecting water into the compressor.

Payling describes a gas turbine engine that includes at least a low pressure compressor (12) and a high pressure compressor 14. The gas turbine engine also includes a water injection apparatus (24) that supplies a water spray into an inlet (26) of the high pressure compressor. Specifically, air is channeled from a low-pressure compressor (12) to a high pressure compressor (14). A portion of compressed air discharged from high-pressure compressor (14) is diverted through an intercooler (68), wherein the air is cooled and injected into high-pressure compressor (14). Furthermore, a water spray is supplied to inlet (26) of high pressure compressor (14). The water spray cools the airflow entering high-pressure compressor (14) for at least each stage of compressor (14) until it evaporates. Payling also describes that in another aspect, an intercooler 68 may be coupled between the low and high pressure compressors. However, Payling does not describe nor suggest operating the intercooler such that condensate is formed in the intercooler from the compressed airflow, and channeling both the condensate and cooled airflow to an inlet of the second compressor to facilitate reducing an operating temperature of the gas turbine engine.

Tsukamoto describes a gas turbine power plant, wherein a spray device (2) sprays fine water droplets into compressed air (A) to humidify the compressed air (A). The humidified air (B) is mixed with fuel (6), and is ignited to produce combustion gases, used to drive a turbine (7). Notably, Tsukamoto does not describe a gas turbine engine that channels condensate and cooled air from an intercooler to a second compressor to facilitate reducing an operating temperature of the gas turbine engine. Specifically, at column 3, lines 6-8 Tsukamoto recites that an "object of the present invention is to provide a gas turbine power plant which has no intercooler for compressed air . . . ."

Claim 1 recites a method for operating a gas turbine engine, including a first compressor, a second compressor, and a turbine, coupled together in serial flow arrangement, wherein the method comprises "channeling compressed airflow discharged from the first compressor through an intercooler having a cooling medium flowing therethrough . . . operating the intercooler such that the compressed airflow is facilitated to be cooled and condensate is formed in the intercooler from the compressed airflow . . . channeling the cooled compressed airflow and the condensate from the intercooler to an inlet of the second compressor to facilitate reducing an operating temperature of the gas turbine engine, wherein channeling the condensate comprises . . . channeling the condensate to annular manifold to facilitate supplying the condensate to a plurality of nozzles coupled to the manifold . . . ejecting the condensate from the plurality of nozzles to an inlet of the second compressor."

None of Zaugg, Payling or Tsukamoto, considered alone or in combination, describe or suggest a method for operating a gas turbine engine, as is recited in Claim 1. More specifically, no combination of Zaugg, Payling and Tsukamoto describes or suggests a method including channeling both cooled compressed airflow and condensate from an intercooler to an inlet of a second compressor. Rather, in contrast to the present invention, Zaugg describes using an intercooler to remove water from compressor stages, and then channeling the water to a combustor, Payling describes injecting cooling water into a high pressure compressor, wherein the water is supplied from an external source, rather than from an intercooler, and Tsukamoto describes a gas turbine power plant that does not include an intercooler.

Moreover, as stated above Zaugg teaches away from the suggested combination. Specifically, Zaugg recites that "[i]n order to avoid disturbances in the machines and apparatuses, [the] **condensate must be removed from the compressor-circuit by water separators**." (Column 1, lines 37-39) As such, in contrast to the assertion in the Office Action, it would not be obvious to one skilled in the art to channel the condensate described in Zaugg to a compressor of a turbine engine.

Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Zaugg in view of Payling and optionally in view of Tsukamoto. Likewise, Claim 1 is submitted to be patentable over Payling in view of Zaugg and optionally in view of Tsukamoto.

Claims 2-8 depend from independent Claim 1. When the recitations of Claims 2-8 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-8 likewise are patentable over Zaugg in view of Payling and optionally in view of Tsukamoto. Likewise, Claims 2-8 are submitted to be patentable over Payling in view of Zaugg and optionally in view of Tsukamoto.

Claim 9 a cooling system for a gas turbine engine that includes at least a first compressor, a second compressor, and a turbine, wherein the cooling system comprises "an intercooler coupled downstream from the first compressor such that compressed air discharged from the first compressor is routed therethrough, said intercooler having a working fluid flowing therethrough to facilitate cooling the compressed air to form condensate, said intercooler configured to discharge the cooled compressed air and the condensate to the second compressor . . . an injection system coupled in flow communication with said intercooler . . . an annular manifold extending circumferentially around the second compressor and comprising a plurality of nozzles, said injection system configured to channel the condensate discharged from said intercooler into said annular manifold to facilitate supplying a flow of condensate to said plurality of nozzles, said plurality of nozzles configured to eject condensate into the second compressor, such that the condensate and the cooled compressed air facilitate reducing an operating temperature of the gas turbine engine."

None of Zaugg, Payling or Tsukamoto, considered alone or in combination, describe or suggest a cooling system for a gas turbine engine, as is recited in Claim 9. More specifically, no combination of Zaugg, Payling and Tsukamoto describes or suggests a cooling system that includes an intercooler configured to discharge both cooled compressed air and condensate to a second compressor. Rather, in contrast to the present invention, Zaugg describes using an intercooler to remove water from compressor stages, and then channeling the water to a combustor, Payling describes injecting cooling water into a high pressure compressor, wherein the water is supplied from an external source, rather than an intercooler, and Tsukamoto describes a gas turbine power plant that does not include an intercooler.

Moreover, as stated above Zaugg teaches away from the suggested combination. Specifically, Zaugg recites that "[i]n order to avoid disturbances in the machines and apparatuses, [the] **condensate must be removed from the compressor-circuit by water separators**." (Column 1, lines 37-39) As such, in contrast to the assertion in the Office Action, it would not be obvious to one skilled in the art to channel the condensate described in Zaugg to a compressor of a turbine engine.

Claims 10-15 depend from independent Claim 9. When the recitations of Claims 10-15 are considered in combination with the recitations of Claim 9, Applicants submit that dependent Claims 10-15 likewise are patentable over Zaugg in view of Payling and optionally in view of Tsukamoto. Likewise, Claims 10-15 are submitted to be patentable over Payling in view of Zaugg and optionally in view of Tsukamoto.

Claim 16 recites a gas turbine engine comprising "a first compressor . . . a second compressor downstream from said first compressor . . . a turbine coupled in flow communication with said second compressor . . . a cooling system comprising . . . an intercooler coupled downstream from said first compressor such that compressed air discharged from said first compressor is routed therethrough, said intercooler having a working fluid flowing therethrough to facilitate cooling the compressed air to form condensate, said intercooler configured to discharge the cooled compressed air and the condensate to the second compressor . . . a condensate injection system coupled in flow

communication with said intercooler . . . an annular manifold coupled in flow communication to said second compressor and comprising a plurality of nozzles, said condensate injection system configured to channel the condensate discharged from said intercooler into said plurality of nozzles for ejection into said second compressor, such that the condensate and the cooled compressed air facilitate reducing a temperature of said gas turbine engine."

None of Zaugg, Payling or Tsukamoto, considered alone or in combination, describe or suggest a gas turbine engine, as is recited in Claim 16. More specifically, no combination of Zaugg, Payling and Tsukamoto describes or suggests a gas turbine engine including an intercooler configured to discharge both cooled compressed air and condensate to a second compressor. Rather, in contrast to the present invention, Zaugg describes using an intercooler to remove water from compressor stages, and then channeling the water to a combustor, Payling describes injecting cooling water into a high pressure compressor, wherein the water is supplied from an external source, rather than an intercooler, and Tsukamoto describes a gas turbine power plant that does not include an intercooler.

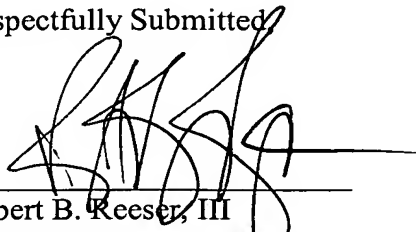
Moreover, as stated above Zaugg teaches away from the suggested combination. Specifically, Zaugg recites that "[i]n order to avoid disturbances in the machines and apparatuses, [the] **condensate must be removed from the compressor-circuit by water separators**." (Column 1, lines 37-39) As such, in contrast to the assertion in the Office Action, it would not be obvious to one skilled in the art to channel the condensate described in Zaugg to a compressor of a turbine engine.

Claims 17-20 depend from independent Claim 16. When the recitations of Claims 17-20 are considered in combination with the recitations of Claim 16, Applicants submit that dependent Claims 17-20 likewise are patentable over Zaugg in view of Payling and optionally in view of Tsukamoto. Likewise, Claims 17-20 are submitted to be patentable over Payling in view of Zaugg and optionally in view of Tsukamoto.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejections of Claims 1-20 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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